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# P-tert-Butylthiacalix[4]arenes functionalized by N-(4--nitrophenyl)acetamide and N,N-diethylacetamide fragments: Synthesis and binding of anionic guests

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## Abstract

© 2017 Vavilova and Stoikov; Licensee Beilstein-Institut. New p-tert-butylthiacalix[4]arenes, which are mono-, 1,2-di- and tetrasubstituted at the lower rim containing N-(4'-nitrophenyl)acetamide and N,N-diethylacetamide groups in cone and partial cone conformations have been synthesized. Their complexation ability towards a number of tetrabutylammonium salts n-Bu 4 NX (X = F - , Cl - , Br - , I - , CH 3 CO 2 -, H 2 PO 4 - , NO 3 - ) was studied by UV spectroscopy. The effective receptor for the anions studied as well as selective receptors for F-, CH 3 CO 2 - and H 2 PO 4 - ions, which based on the synthesized thiacalix[4]arenes, have been obtained. It was shown that p-tertbutylthiacalix[ 4] arene tetrasubstituted at the lower rim by N-(4'-nitrophenyl)acetamide moieties bonded to the anions studied with association constants within the range of 3.55 × 10 3 -7.94 × 10 5 M -1 . Besides, the binding selectivity for F - , Cl - , CH 3 CO 2 - , and H 2 PO 4 - anions against other anions was in the range of 4.1-223.9. Substituting one or two fragments in the macrocycle with N,Ndiethylacetamide groups significantly reduces the complexation ability of the receptor. In contrast to the 1,3-disubstituted macrocycle containing two N-(4'-nitrophenyl)acetamide moieties, the 1,2-disubstituted thiacalix[4]arene, which contains only one such fragment and a N,N-diethylacetamide moiety, selectively binds F - anions.

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## Keywords

Anion binding, Synthesis, Thiacalixarenes, UV spectroscopy

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